Falcon 50 FM

6 Band – Digital Audio FM and DAB Processor

- **Dual LCD front display version available**
- **Automatic or manual switching between inputs**
- **50 factory presets + 50 user-definable**
- **Built-in High Performance Stereo Generator**
- **Dual composite outputs**
- **ITU-compliant MPX power control**
- **Widest range of processing controls**
- **Improved peak limiting system**
- **Analog and Digital Stereo I/O**
- **Day-part automation**
- **Software Remote Control via serial, USB & IP**
- **Optional DAB output module**

Relying on Axel Technology's extensive know-how in audio processing techniques, the Falcon 50 has been designed and built using a new approach that incorporates the most up-to-date components and technologies. Its efficient design allows the Falcon 50 to produce top-level results in a cost-effective way.

The largest control set allows you to paint a truly unique and competitive on-air sound: from detailed and flat to heavy and loud. Its exceptional audio quality is maintained even at extreme settings.

Whether your audio system contains analog, digital or both formats, the Falcon 50 can be configured to fit in perfectly. A sophisticated module allows flexible switching between inputs, e.g. for emergency purpose. Fail-safe operation is assured by an internal bypass on all the audio and MPX I/O circuits.

Two Composite Baseband Outputs are provided, each with independent level control. The MPX clipping stage is user-enable and adjustable. MPX power can be limited accordingly to ITU R-BS 412 Specification.

Two serial RS232 ports, an USB port and a TCP/IP Ethernet connection (the latter available as an option) permit remote control and monitoring from almost any

Basato sull'ampio know-how acquisito da Axel Technology nel campo del processamento audio, Falcon 50 è stato progettato e realizzato utilizzando il più moderno design e le più moderne tecnologie. La sua efficiente architettura consente di ottenere risultati di altissimo livello al miglior rapporto qualità / prezzo.

L'ampio set di controlli permette di disegnare un 'sound' veramente unico e competitivo: sia esso dettagliato e neutro o incisivo e forte. L' eccezionale qualità audio è mantenuta anche nelle condizioni più estreme.

Falcon 50 si adatta perfettamente sia a sistemi audio di tipo analogico che digitale. Un sofisticato modulo consente una flessibile commutazione tra gli ingressi, ad esempio in caso di emergenza. Bypass interni su tutti i circuiti audio e su quello MPX assicurano la continuità di trasmissione in ogni condizione.

Due sono le uscite MPX fornite, ognuna delle quali dotata di controllo di livello indipendente. Uno stadio di clipping Mpx è abilitabile e regolabile. La potenza di uscita Mpx può essere limitata in conformità alle norme ITU.

Due porte seriali RS232, una porta USB ed una connessione Ethernet TCP/IP (disponibile su opzione)

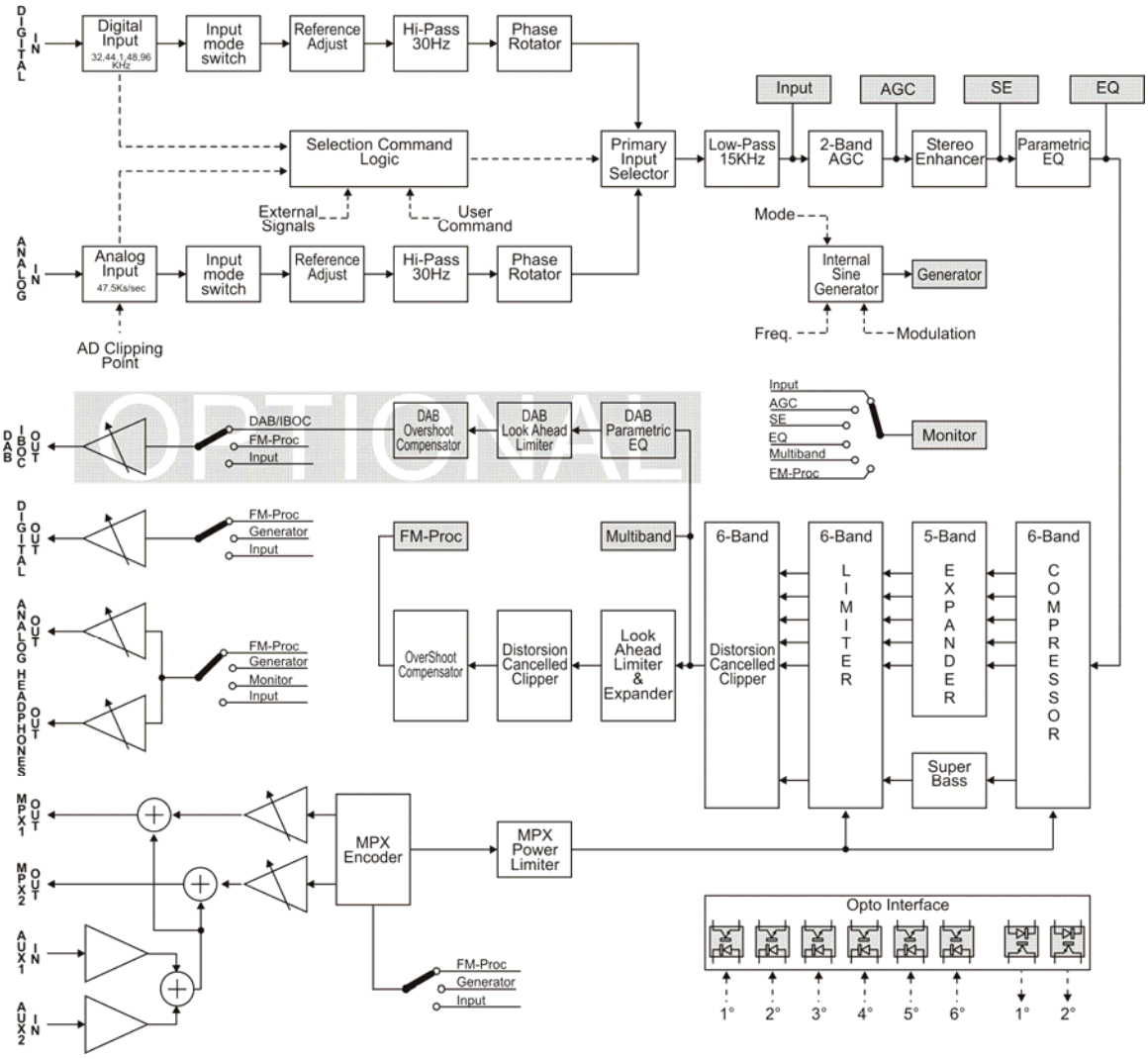
location through the use of a standard PC and the dedicated control software which comes with the unit.

Falcon 50 set up is quick and easy, thanks to a wizard based on less/more controls. User-configurable remote control functions (including preset programming) are available through optocoupled inputs. For more convenience, a complete day-part automation is also completely self-contained.

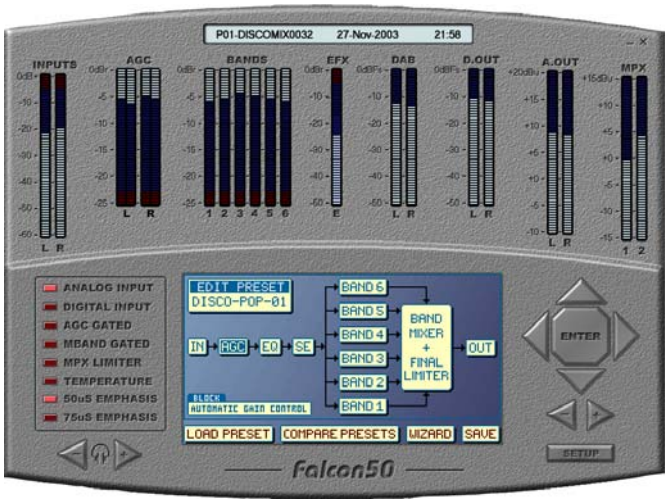
permettono il controllo remoto a qualunque distanza e da qualunque Pc dotato del software di controllo a corredo.

Il set-up del Falcon 50 è semplice e rapido, grazie anche ad una procedura *Wizard* di tipo *less / more*. Varie funzioni di controllo remoto (tra cui il cambio di preset) sono configurabili e disponibili su ingressi fotoisolati. Il cambio di preset è inoltre totalmente programmabile tramite un apposito scheduler su base settimanale.

Block diagram



Remote control software screen displays current level of multiple parameters. Controls are grouped accordingly to the processor's block diagram. Double clicking on each block will let You access the associated parameters.
Suitable presets can be build by the Administrator and three-level lock functions can be applied to ensure no unintended change of settings by the daily user.



Il pannello del software di controllo remoto mostra il livello corrente di tutti i parametri di lavoro. I controlli sono raggruppati secondo lo schema a blocchi del processore: Un doppio click su ciascun blocco darà accesso a tutti i parametri associati a quel determinato blocco. Possibilità di definire vari livelli e diritti di accesso, dall'Amministratore, all'editore della radio all'utente base

A sophisticated 6 Band process

Main features of Falcon 50 architecture are:

- Bi-channel, two-band AGC. Selectable coupling between bands and Left/Right channels
- Integrated effects: STEREO ENHANCER, SUPER BASS, BRILLIANCE. 3-band parametric equalizer
- Cross frequencies between bands selectable among 5 banks containing 6 filters each
- Capability for a virtually reduced number of bands thanks to elastic coupling between band compressors
- Complete set of controls for each band: Clipping Level / Mode, Threshold, Attack & Release time of limiters and compressors, Threshold + Expansion factor of Expanders
- "Solo" function for separated listening of each band
- 6 band mixing before final Limiter
- Full-antialiased process with X8 over-sampling
- Separated process for signals DAB/IBOC compliants (available as an option)

Un sofisticato processo a 6 bande

Le principali caratteristiche dell'architettura del Falcon 50 sono:

- AGC a due Bande, con struttura bi-channel. Accoppiamento selezionabile tra le due bande e tra i canali destro e sinistro.
- Effetti integrati: STEREO ENHANCER, SUPER BASS, BRILLIANCE. Equalizzatore a 3 Bande parametrico
- Frequenze di incrocio delle bande selezionabili tra 5 banchi di 6 filtri ciascuno
- Possibilità di operare virtualmente con un numero minore di bande grazie all' accoppiamento elastico tra i compressori delle varie bande
- Completo set di controlli per ogni banda: Modalità e Livello di Clipping, Threshold, Tempi attacco / rilascio di compressori e limiters e Threshold/fattore di espansione degli Expander
- Funzione "solo" per l'ascolto indipendente di ciascuna banda
- Mix delle 6 bande prima del Limiter finale
- Processo full antialiased con fattore di sovracampionamento X8
- Processo separato per la generazione di segnali adatti alla trasmissione in sistema Dab o IBOC (su opzione)

TECHNICAL SPECIFICATIONS

GENERAL

Dimensions	3 rack unit, 352 x 483 x 132 mm

~ AC Rate	220 Vac 50 Hz / 110 Vac 60 Hz ±10%

ANALOG AUDIO INPUT

Conversion	24 bit Sigma-Delta (Crystal CS4272)
Connector Type	XLR female el. Balanced - EMI –suppressed
Nominal Level adj	- 10.0dBu to +15.0dBu (0.1dBu step)
AD Clipping Point	0.0dBu to 24.0dBu (0.1dBu Step)
AD Dynam. Range	104 dB RMS (107dB A weighted)
Impedance	600Ω / 10KΩ
Input Modes	Stereo, Mono L+R, Mono L, Mono R, L/R Swapped, separated R & L polarity inversion
Phase Rotator & Hi Pass Filter	Selectable & Configurable separately from Digital Input

DIGITAL AUDIO INPUT

Connector Type	XLR female & optical tos/link
Formats	AES3/EBU
Input Rates	32/44.1/48/64/88.2/96KHz with automatic selection and jitter correction
Nominal Level adj	From 0.0dBFs to –25dBFs (0.1dBu Step)
Dynamic Range	125dB (Typ), 122dB (Min)
Resolution	16 / 20 / 24 bit
Input Modes	Stereo, Mono L+R, Mono L, Mono R, L/R Swapped, separated R & L polarity inversion
Phase Rotator & Hi Pass Filter	Selectable & Configurable separately from Analog Input

ANALOG AUDIO OUTPUT

Conversion	24 bit Sigma-Delta (Crystal CS4272)
Connector Type	XLR male el. Balanced - EMI –suppressed
Nominal Level	-5.0 dBu to +20.0dBu (0.1dBu step)
Source Impedance	50 Ω
Load impedance	600 Ohm or greater, balanced or unbalanced
Group Delay	5 msec

DIGITAL AUDIO OUTPUT

Connector Type	XLR male & optical tos/link
Formats	AES3/EBU, IEC60958, EIAJCP1201
Sample Rates	32/44.1/48/64/88.2/96KHz internal or synchronized to Digital Input / AES-EBU SYNC Input
Output Level	From 0.0 dBFs To –25.0dBFs (0.1dBFs Step)
Resolution	16 / 20 / 24 bit
Group Delay	5msec

INPUT SELECTION *(either the Analog or the Digital Input can be set as primary)*

Switch Mode	- Switch from a software command - Switch from a remote command - Switch in the event of audio failure
Fail Time	5-60Sec (step 5 Sec)

Fail mode	- No Signal on Primary input - Signal under - 30dB of nominal value - Left-Right unbal > 6dB on Primary channel
Restore Time	1-10 Sec (step 1 Sec)

AUX IN (1,2 and 3)	
Connector Type	floating BNC, EMI suppressed
Level	–20dB or 0dB Gain (jumper selectable).
Input Impedance	> 10 Kohm

SYNC-OUT	
Connector Type	floating BNC, EMI suppressed
Sync-Out	TTL-level (5Vpp) 19 kHz Pilot Ref. Out

REMOTE CONTROL (GPI) INTERFACE	
Inputs	6 TTL level
Outputs	4 TTL level

REMOTE COMPUTER INTERFACES	
Serial Ports	1 x RS-232 38400 Baud
Ethernet interface	Static IP 10/100Mbits Interface (option)

Connector	SubD 25 pin
Type	optically decoupled

USB interface	2 Port Usb 2.0 Full Speed
Rem. Ctrl software	Dedicated, for Win 95,98,XP,NT,2000

MPX OUTPUT MODULE *Mpx Signal, MpxClipper & Overshoot Compensator Modules are processed at 760Ksamples/sec*

Conversion	24 bit (Texas BB PCM1738)
Mpx Outputs	2, with independent level controls
Mpx Modes	Stereo, Mono, L+R, L-R, Pilot Only, No Pilot
Mpx Clipper	On/Off & 95% - 105%, 1% Step control
Cmp 1 output level	– 10.0dBu to +15dBu (0.1 dBu step)
Cmp 2 output level	– 10.0dBu to +15dBu (0.1 dBu step)
Mod Power Limiter	adjustable from –1.0dB to +12dB from ITU Ref
Pilot Frequency***	19 KHz ± 1Hz
Pilot Injection	–14.0 to –26.0dB (0.1dB Step) equal to 5% to 15 % (Ref 100% Mod)
Pilot Phase	Adjustable ± 12 deg. (1 deg step)
Pilot TDH+Noise	0.06% (TDH 0.005%)
Stability***	±10 ppm (-10 to +55 °C)

Stereo Separation	>70 dB typ. on the whole band (75dB@ 1Khz)
Crosstalk M/S	70 dB
Crosstalk S/M	70 dB
38KHz suppress.	> 80dB
Pilot Protection	> - 70 dB (Relative to 10% of Pilot injection)
RDS Protection	better than -55 dB @ 56Khz, better than - 65dB @ 57 Khz (Mpx Clipper Disabled)
S/N	>85 dB (on 60 Khz Bandwidth)
Load Impedance	600 Ohm or greater
Out. Conn. type	BNC floating over chassis, EMI sup.
Pre-emphasis	50usec, 75usec (+- 3usec adjust control available to compensate external problems)

**** higher stability available on request*

BY-PASS MODE

Frequency Resp	30 Hz-15 KHz (- 0.1 dB)
Output Noise	-103 dB (A-weighted)
THD	0.008% - (0.005% @ 1Khz)
Stereo CrossTalk	> -80dB (from 30Hz to 15Khz)
Group Delay	2 ms

SINE WAVE INTERNAL GENERATOR

Purpose	Can feed each output module for test
Freq	30, 100, 400 Hz, 1Khz, 5Khz, 10Khz, 15Khz
Level	from 0% to 120% of Modulation
Modes	Left=Right, Left=-Right, Left or Right Only

SOUND ENHANCING CONTROLS

Stereo Enhancer	On/Off, Band, Depth, Limiter Thr & Drive
Super Bass	On/Off, Bass Type & Drive
Brilliance	On/Off & Level

PARAMETRIC EQUALIZER CONTROLS

Low Pass Filter	On/Off, Gain & Slope
Mid Range Filter	On/Off, Gain & Width
Hi Pass Filter	On/Off, Gain & Slope

**All sound enhancing and Parametric equalizer modules are processed at 47.5 Ksamples/sec.*

PRESETS: 50 Factory Presets + 50 user definable

SIX BANDS MULTIRATE PROCESS* CONTROLS

Band 1-6 Compr.	Threshold, Attack & Release Speed
Band 1-6 Compr. Coupling	Quantity & Rule of Compressors Coupling
Band 1-6 Limiters	Threshold & Release Speed
Band 2-6 Expand.	Threshold & Expansion ratio
Band 1-6 Distors. Cancelled Clippers	Threshold adjustable (Clip Mode for Band1 Only)
Band 1-6 Mixing	Gain & Solo
Coupling Select.	2-3-5-6 Bands-like system and more
Filters Banks	Five Banks of six filters (preset selectable)
Speech Detector	automatic voice detecting
Additional MultiBand Controls	MB Gate Threshold, MB Drive, MB Idle Gain, MB Idle Speed, MB Agc Coupling

BICHANNEL, DUAL BAND AGC CONTROLS

Hi / Lo Bands	Crossover Frequency & slope
Main	Drive, Gate Threshold, Attack & Release Speed, Idle Compression & Speed
Coupling	Coupling between the two bands
Work zone	Threshold & Release
L/R Linkage	0- 100 %
AGC processing	47.5 Ksamples/sec

WIZARD PANEL

Density	Less / More Density (+/-10)
Compression	Less / More (+/-10)
Equalization	Warmth to Open (+/-10)
Expansion	Less / More (+/-10)

**Low Delay Multirate 6 band predictive not linear process (full Antialiased).*
Band1 & Band2 are processed at 47.5 Ksamples/sec.
Band3 & Band4 are processed at 190.0 Ksamples/sec.
Band5 & Band6 are processed at 380.0 Ksamples/sec.

DAB-IBOC OUTPUT MODULE (OPTIONAL)

Connectors	XLR male & optical tos/link
Formats	AES3/EBU
Sample Rates	the same as the Digital audio Output
Output Level	0.0 dBFs to – 25.0dBFs (0.1dBFs Step)
Group Delay	5 ms

DAB-IBOC MODULE CONTROLS

Low Pass Filter	On/Off, Gain & Slope
Mid Range Filter	On/Off, Gain & Width
Hi range Filter	On/Off, Gain & Slope
LookAhead Limiter	Drive & LookAhead Time
Overshoot Comp.	On/Off

**All DAB Parametric equalizer filters are processed at 47.5 Ksamples/sec.*
**The LookAhead Final Limiter & The Overshoot Compensator are processed at 190 Ksamples/sec*

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